CLAIM AMENDMENTS

1. (Currently Amended) A method of three-dimensional measurement, evaluation, and grading of fabric/textile structure/garment appearance using a photometric stereo technique, the method comprising:

    with a fixed digital camera positioned above a piece of fabric, shining parallel light beams from at least two different inclined directions onto a surface of the fabric,

    capturing with the camera different reflected images of the surface of the fabric while the surface of the fabric is illuminated from each of the at least two different inclined directions, and

    analysing the reflected images captured to derive surface normal gradients of the fabric based on intensities of light reflected from a number of evenly distributed points on the surface.

2. (Previously Presented) The method according to claim 1, including shining parallel light beams onto the surface of the fabric from four different directions.

3. (Currently Amended) An apparatus for three dimensional measurement, evaluation, and grading of fabric/textile structure/garment appearance using a photometric stereo technique, the apparatus including:

    a digital camera mounted above a piece of fabric,

    means to illuminate the fabric from at least two different directions using calibrated inclined parallel light sources integrated in one housing, wherein different images of the fabric, illuminated from the at least two different directions, are captured by the camera,

    means for analysing images of the fabric captured by the camera, and

    a computer programmed to derive values of P and Q from the images captured, where P and Q are summations of surface normal gradients for a plurality of evenly distributed points in an x direction and in a y direction, respectively, on the surface of the fabric.

4. (Previously Presented) A method of grading fabric/textile structure appearance based on values P and Q, the method comprising:

using a fixed digital camera positioned above a piece of the fabric, shining at least two different parallel light beams from inclined directions onto a the surface of the fabric,

capturing different images reflected from the surface with the camera,

analysing the images captured to derive values of P and Q, where P and Q are summations of surface gradients for a plurality of evenly distributed points in an x direction and in a y direction, respectively,

calibrating P + Q against a subjective grade analysis of the fabric, and

thereafter, using calibrated P and Q and determining the grade of the fabric.

5. (Previously Presented) The method of claim 4, including using four different parallel light beams.

6. (Previously Presented) The method of claim 4, in which the surface gradients p and q are derived from

$$p = \frac{I_e E_w - I_w E_e}{I_e E_w + I_w E_e} \cdot tg\alpha$$

$$q = \frac{I_n E_s - I_s E_n}{I_n E_s + I_s E_n} \cdot tg\alpha$$

$$c = \frac{I_e \cdot \sqrt{p^2 + q^2 + 1}}{\sin\alpha + \cos\alpha \cdot p}$$

7. (Currently Amended) An apparatus for three dimensional measurement, evaluation, and grading of fabric/textile structure/garment appearance using a photometric stereo technique including:

a digital camera mounted above a piece of fabric,

means to separately shine inclined parallel beams from at least two different directions onto a surface of the fabric below the camera,

means for analysing separate images of the fabric, illuminated from the at least two different inclined directions, captured by the camera for each light beam, respectively, and

a computer programmed to derive surface normal gradients of the fabric based on intensities of light reflected from a number of evenly distributed points~~of~~ <u>on</u> the surface.

8. (Currently Amended) An apparatus for three-dimensional measurement, evaluation, and grading of fabric/textile structure/garment appearance using <u>a</u> photometric stereo technique according to claim 7, including means for shining inclined parallel light beams from four different directions evenly distributed with respect to the camera.